

# NATIONAL LIBRARY OF MEDICINE



## NEW FRONTIERS IN HEALTH COMMUNICATION

SESQUICENTENNIAL  
1836-1986

### ***About the Cover***

The nearly life-size **"Portrait of Professor Gross,"** also called **"The Gross Clinic,"** was painted by Thomas Eakins in 1875. Eakins had attended lectures at the Jefferson Medical College and had undoubtedly seen Samuel David Gross, Chairman of Surgery, both as lecturer and in the clinic. Eakins' students and friends posed as the spectators of the operation. In addition, Eakins included a self-portrait of himself sketching the procedure at the center right of the painting. The procedure which is being performed is the removal of a piece of bone diseased by osteomyelitis. The woman in the picture is a relative of the patient and her presence indicates that this is a charity case. The law at that time required that a relative be present for surgery on a charity patient, a situation which was permitted by doctors who even then wished to avoid malpractice suits. The painting has remained at Jefferson since 1875 despite attempts by the National Gallery of Art to acquire it.

Courtesy of Jefferson Medical College, Philadelphia, Pennsylvania.

### ***About the Illustrations***

The works of art used to illustrate the sections of this brochure were chosen to link past to present as part of the Sesquicentennial of the National Library of Medicine. The pieces selected demonstrate not only technical aspects of medicine in history, but also allow us access to the manner in which the people of various periods in history perceived the medical practitioners of their time. Unless otherwise indicated, the illustrations are from the prints and photographs collection of the National Library of Medicine.





Instruction in Surgery. Five physicians and their colleagues in the surgical amphitheatre of the Massachusetts General Hospital watch as the anesthetist administers ether to a patient who is about to have surgery. This illustration appeared in an 1889 issue of *Harper's Weekly*.

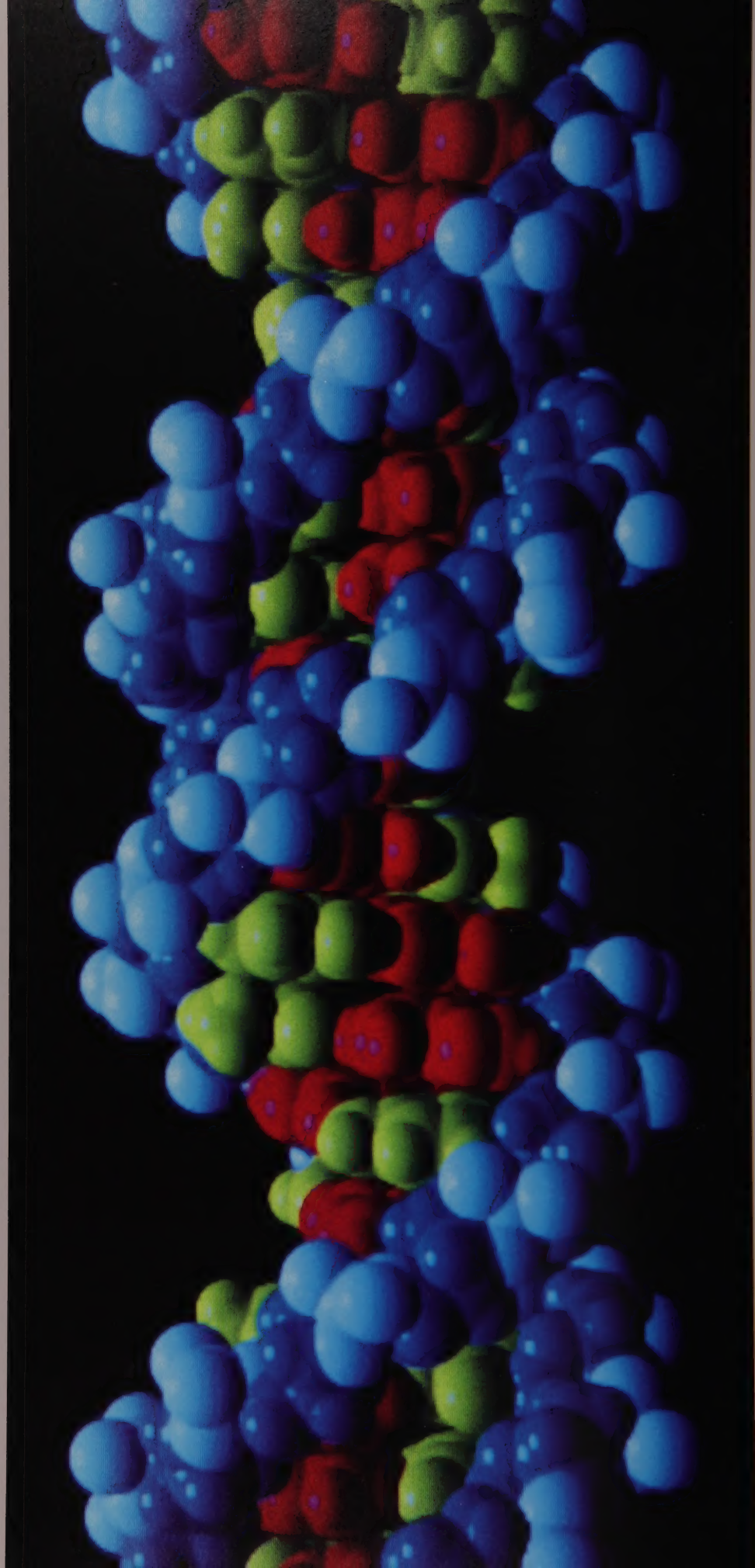


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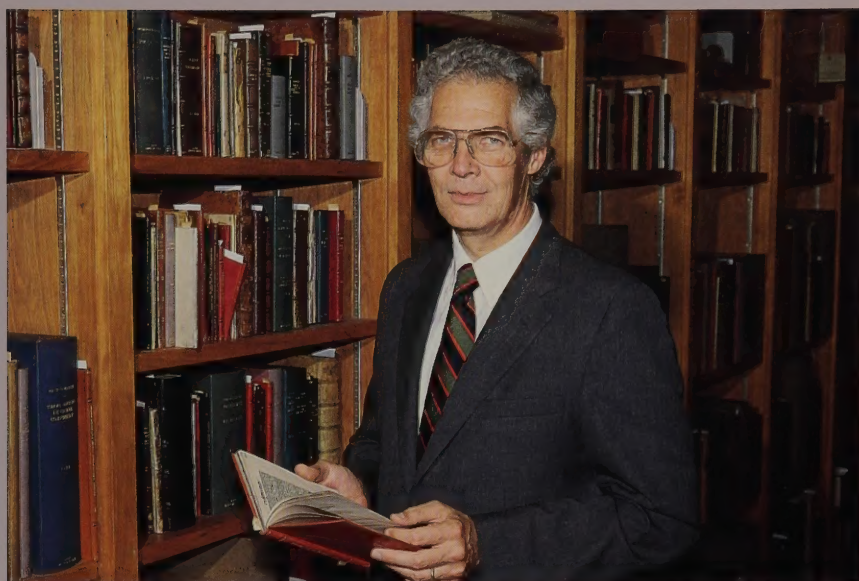


# NATIONAL LIBRARY OF MEDICINE

*The National Library of Medicine was originally established 150 years ago, in 1836, as the Library of the Army Surgeon General's Office. Perhaps the key event in the library's history occurred in 1865, when Dr. John Shaw Billings became director. For the next 30 years he worked tirelessly to expand the library's holdings and open it as a source of biomedical information for all physicians.*







*The wealth of new medical information issuing from research centers around the world cannot be used to improve our health and cure disease unless it is made available rapidly to the entire health science community. The astonishingly varied services of the National Library of Medicine are indispensable in this task.*

*Modern computer and communications technologies today routinely assist in providing vitally needed medical information. Systems now being developed by the Library will expand such information dissemination capabilities dramatically in the years to come.*

*I believe that the National Library of Medicine — with its past accomplishments, present services, and future promise — is an institution in which we all can take pride.*

*Donald A. B. Lindberg, M.D.  
Director  
National Library of Medicine*

Left: Computer model of a DNA molecule.  
Courtesy of the Division of Computer Research and Technology, National Institutes of Health, Bethesda, Maryland.



## **NATIONAL LIBRARY OF MEDICINE**

### **NEW FRONTIERS IN HEALTH COMMUNICATION**

*First established in 1836, the National Library of Medicine started as a few shelves of books housed in an office near the White House. Known at its inception as the Library of the Army Surgeon General, it moved in 1866 to Ford's Theatre, site of*



The Army Medical Library staff circa 1910.

*President Lincoln's assassination. One year earlier the library's collection had been placed in the charge of Dr. John Shaw Billings, a Civil War surgeon. Guided by Dr.*

*Billings, the library moved in 1887 into its own headquarters on the Mall in downtown Washington, where the library's collection and influence grew dramatically, and where the library began to build its international reputation as the most comprehensive collection of medical data in the world. In 1956, an act of Congress transferred the collection from the Department of Defense to the Department of Health, Education and Welfare and renamed the institution the National Library of Medicine. In 1962, the library moved to its current quarters in Bethesda. A second building, the Lister Hill Center, was constructed in 1980.*



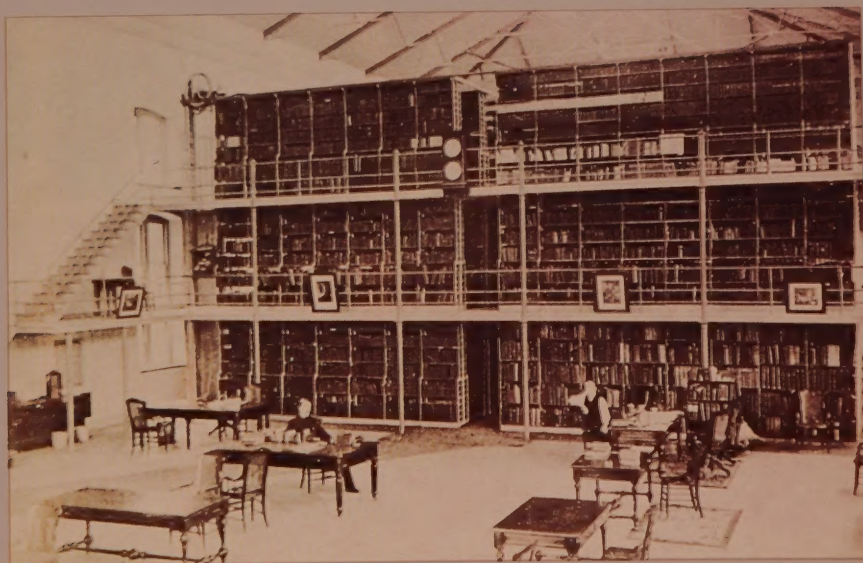
Ford's Theatre, Washington, D.C., housed the collection from 1866 to 1887.  
Courtesy of Ford's Theatre.





A Board of Health doctor in a New York tenement, a wood engraving by W. A. Rogers. This illustration appeared on the cover of volume 33 of *Harper's Weekly* in 1889. In this interior scene, a doctor listens to the chest of a child who is held by its mother. The older sister watches.

Interior view of the "Library Hall" of the new Army Medical Library (circa 1887-1894). John Shaw Billings is seen seated at the right.





## NATIONAL LIBRARY OF MEDICINE: THE WORLD'S LINK TO HEALTH

**T**he National Library of Medicine in Bethesda, Maryland, is the world's largest medical research library. Its holdings include more than 3.5 million books, journals, technical reports, theses, pamphlets, photographs and audiovisual materials covering more than 40 biomedical areas and related subjects from chemistry to psychology, botany to zoology and veterinary medicine.

The library also houses one of the world's finest historical collections of rare medical texts and manuscripts dating as far back as the 11th century.

With materials in 70 languages and information exchange capabilities internationally, the library is a worldwide source for all health professionals. Some 4 million journal articles, books, and computerized information searches were provided by NLM in 1985. Material may be consulted at the library, borrowed through interlibrary loan or searched by means of the library's computerized online databases.



Present and past catalogs.



A few of the historical medical texts in the library's collection.

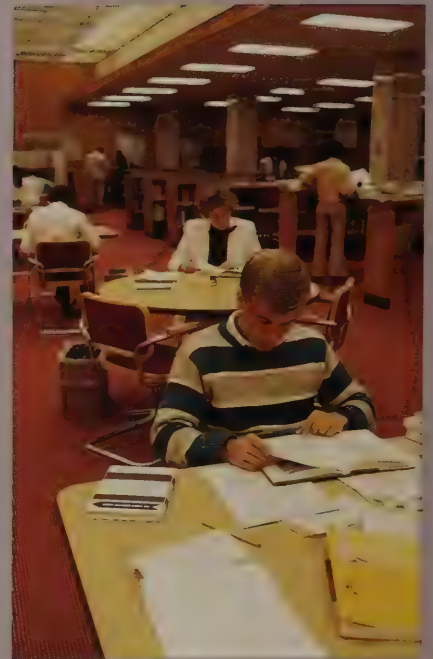
Right: Oil portrait of John Shaw Billings by Cecilia Beaux. The portrait was painted in 1895, thirty years after Dr. Billings became director of the NLM.







Interior view of the rotunda and catalog area of the National Library of Medicine.



The NLM collection is available to all members of the health care profession, students and the general public.

## ***MEDLINE: MEDICAL INFORMATION WHEN MINUTES COUNT***

***M***EDLINE makes a vast store of biomedical information immediately available to health care professionals nationwide, helping them in minutes to locate medical information that used to take days to find.

Through MEDLINE, health care professionals can tap into NLM's computerized reservoir of 6 million-plus references to journal articles accumulated since 1965 and growing at a rate of 300,000 a year. Not only

does MEDLINE allow individuals to call up a list of pertinent articles in minutes, but it allows users to print abstracts for many of those articles at their own terminals. MEDLINE is accessible at 3,500 institutions, including universities, medical schools, hospitals, government agencies, and commercial organizations. Recently, growing numbers of individual health professionals have been joining the network.





A French print showing military field medicine. Many surgical advances have resulted from the need for finding fast, efficient resolutions to problems and injuries encountered during wartime. This print, entitled "Médecin Chirurgien Major" (Doctor Surgeon Major), is a hand colored lithograph made by Hippolyte Lalaisse in the 1840s.



NLM's computers offer immediate access to more than 6 million journal article references.

## **THE TOXICOLOGY INFORMATION PROGRAM:**

### **MAKING THE WORLD SAFER**



**T**he Toxicology Information Program (TIP) makes information on toxic substances widely available to health care professionals and environmental and governmental officials. The service includes several computerized databases that contain up-to-date data on and references to chemicals and toxic substances and their effects on health and the environment.

In all, NLM has some two dozen databases, including information on cancer research, population and reproduction, bioethics, health planning, audiovisual materials and other specialized areas of health and disease.

Above: The Toxicology Information Program data bases at the NLM can provide immediate information about substances, their toxicity, and possible effects on people, animals and the environment.

Right: This twentieth century reproduction is of a medieval woodcut of a pharmacist. The first pharmacopoeia was published in Nuremberg, Germany in 1542, which indicates that standards for drugs were established by that time.









## RESEARCH AND DEVELOPMENT:

## NEW FRONTIERS IN INFORMATION SCIENCE

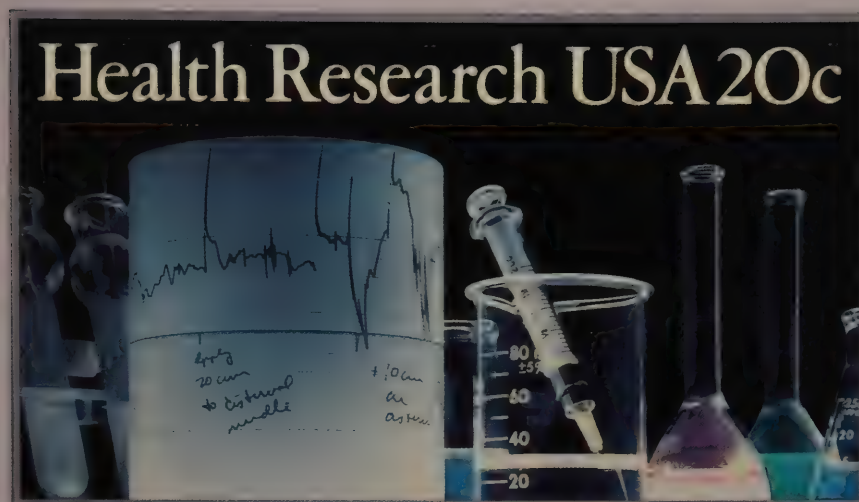
*NLM's Lister Hill National Center for Biomedical Communications was established to expand the uses of computer and communications technology in the health*

*care profession and to improve systems for collecting biomedical data and distributing it to those who need it.*

*The center is investigating ways to use the most modern technology in medical*

*education, artificial intelligence, and to keep health care professionals abreast of the latest developments in medicine.*

*At the same time, the Lister Hill Center is devising ways to collect more quickly and distribute more efficiently the wealth of biomedical material being generated each year and is developing programs to help the health care profession take advantage of the wealth of material stored at the library.*

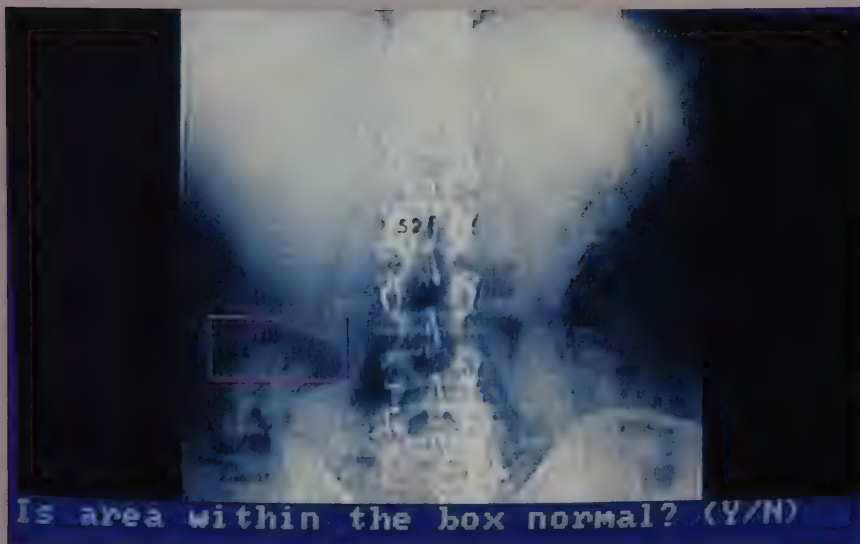


NLM's dissemination of the results of biomedical research is an integral part of the research process. Courtesy of U.S. Postal Service.



NLM's Lister Hill Center for Biomedical Communications, established to expand uses of computers in the improvement of biomedical communications systems.

Facing page: "Le Malade Imaginere," by Honore Daumier (1808-1879). Daumier was most well-known during his lifetime as a lithographer and a caricaturist who used these two mediums as vehicles for his incisive social satire. After his death, his skill as a painter won acclaim and influenced many later artists. It is his caricatures, however, for which he is most recognized today.



Part of present-day medical education consists of observing and making diagnoses based on tests and x-rays of actual patients. A videodisc education program shows the student what to look for and provides immediate feedback on the accuracy of the student's responses.

Right: "To Childhood Illness," by Ben Shahn. Ben Shahn (1898-1969) was a painter, printmaker and illustrator whose work shows an interest in social and political issues. This piece is an example of the spare, linear style that is present in his work.

## MEDICAL EDUCATION IN THE YEAR 2000

*In the future, medical students will have seen, diagnosed and treated a wide array of patients before they ever actually see a real one. The Lister Hill Center has already developed a "computer patient" complete with a variety of symptoms and a full life history.*

*Based on micro-computer, videodisc, and voice recognition technology, the system allows the patient to be "seen" and to describe his own symptoms. With the student's voice command, the patient's medical history can be delved into and medical tests ordered and the results displayed.*

*Afterward, the computer evaluates the student's performance. Were the right tests ordered? Did the student draw the correct conclusions and make a valid diagnosis? What treatment was ordered? Did the patient survive?*



Medical education in the future will use a combination of computers and audio and video disks to simulate patients and their histories.





Ben Shahn



Above: The capabilities of the information systems at NLM will continue to expand with increasing knowledge and information, allowing a vast wealth of information to be shared world-wide.

Above right: The educational system for health professionals must develop progressive teaching tools to provide students with information.

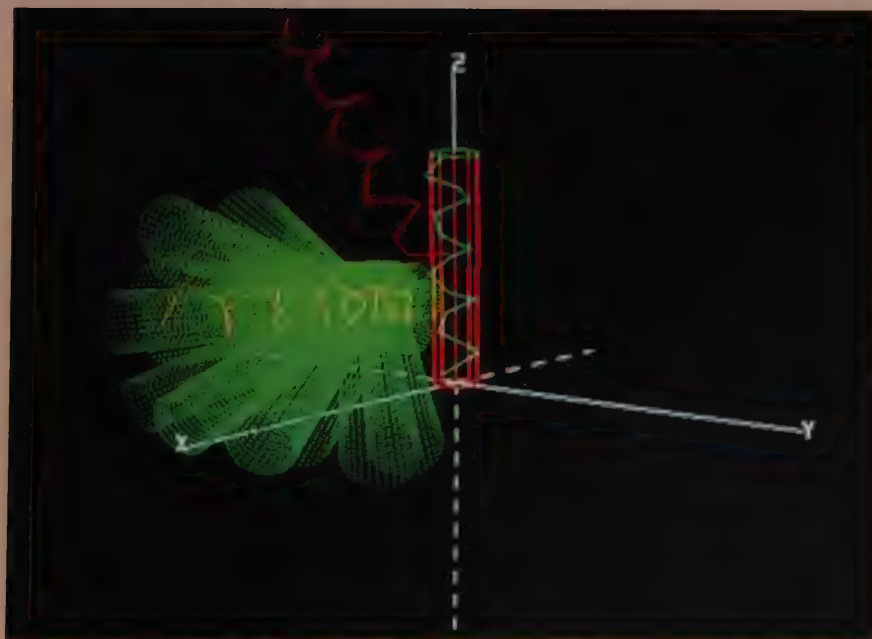


## ***EXTRAMURAL PROGRAMS: INVESTING IN KNOWLEDGE***

***T***he library has a program of grant assistance to improve U.S. medical libraries, support training and research in medical library and information

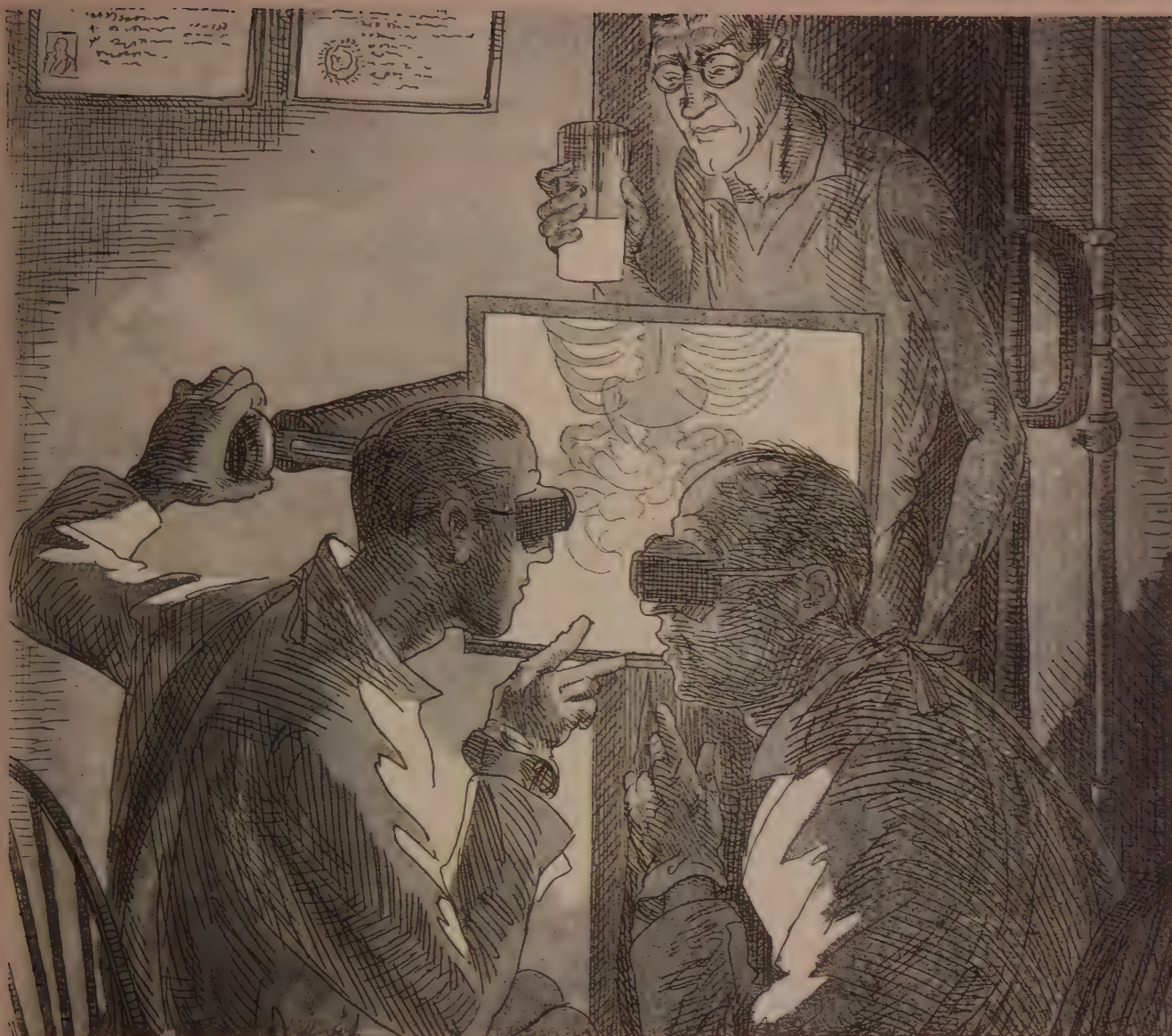
science, and support various categories of publications. In the 1980's, the library has emphasized grants to investigate computer applications in medicine and to develop large-scale integrated information systems in academic health science centers.

Grants go to health science institutions and to individual researchers, academicians, librarians and computer scientists with the goal of expanding the biomedical information base and developing systems for efficient dissemination of that information.



A computer model depicting one stage of the execution of PROTEAN, an artificial intelligence program for inferring tertiary protein structure from NMR spectroscopy data. Courtesy of the Stanford University Knowledge Systems Laboratory, Palo Alto, California.





"The Fluoroscope," 1926, etching by John Sloan (1871-1951). Sloan had a background in illustrating newspapers, magazines and books which served him

well in his painting and printmaking. He is well-known for his etchings, particularly those of life in New York. Sloan was interested in the everyday aspects of life

and most of his work concerns the life of the urban working man. In this vignette, Sloan himself appears as the patient.

Far right: "Personality Essay" by Craig Dennis. This is a colored lithograph done in the 1970s. Dennis is a contemporary artist with an interest in medical subjects.

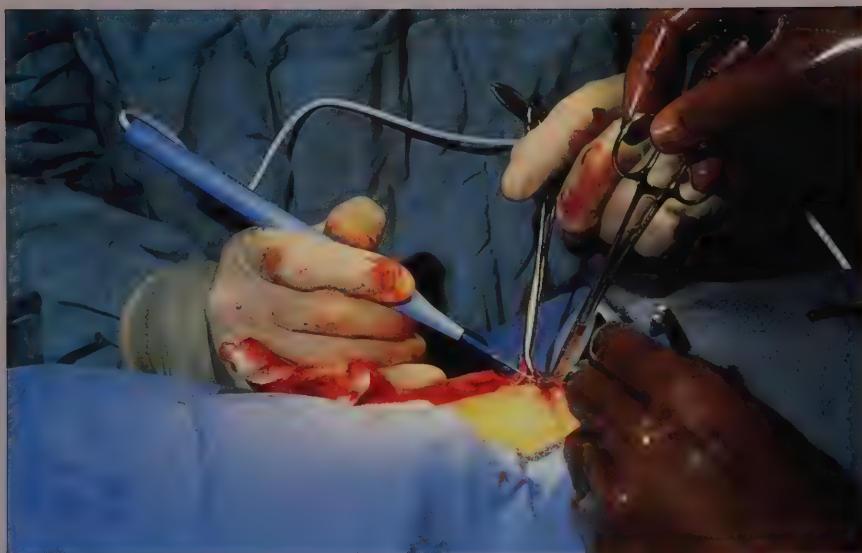
## **FUTURE:**

### **INFORMATION SYSTEMS PACE BREAKTHROUGHS IN MEDICINE**

**"A**rtificial intelligence" systems that can provide expert medical diagnosis and management, new radiographic imaging techniques, the computerized medical record, information systems that support biomedical discovery as well as the dissemination of data: It's a future that NLM is working on now.

A strong health care system depends on easy access to existing information and the ability to communicate quickly and clearly. Progress depends on an educational system that offers the latest in teaching tools to deliver the vast and ever-expanding pool of biomedical information simply and effectively.

NLM will continue to be a leading center for biomedical information as it sets the pace for technologies that allow health care professionals to have access to that information when and where they need it.



NLM's products and services support patient care. Even during surgical procedures, NLM information services are being consulted.



The NLM serves as a worldwide source for all health professionals.





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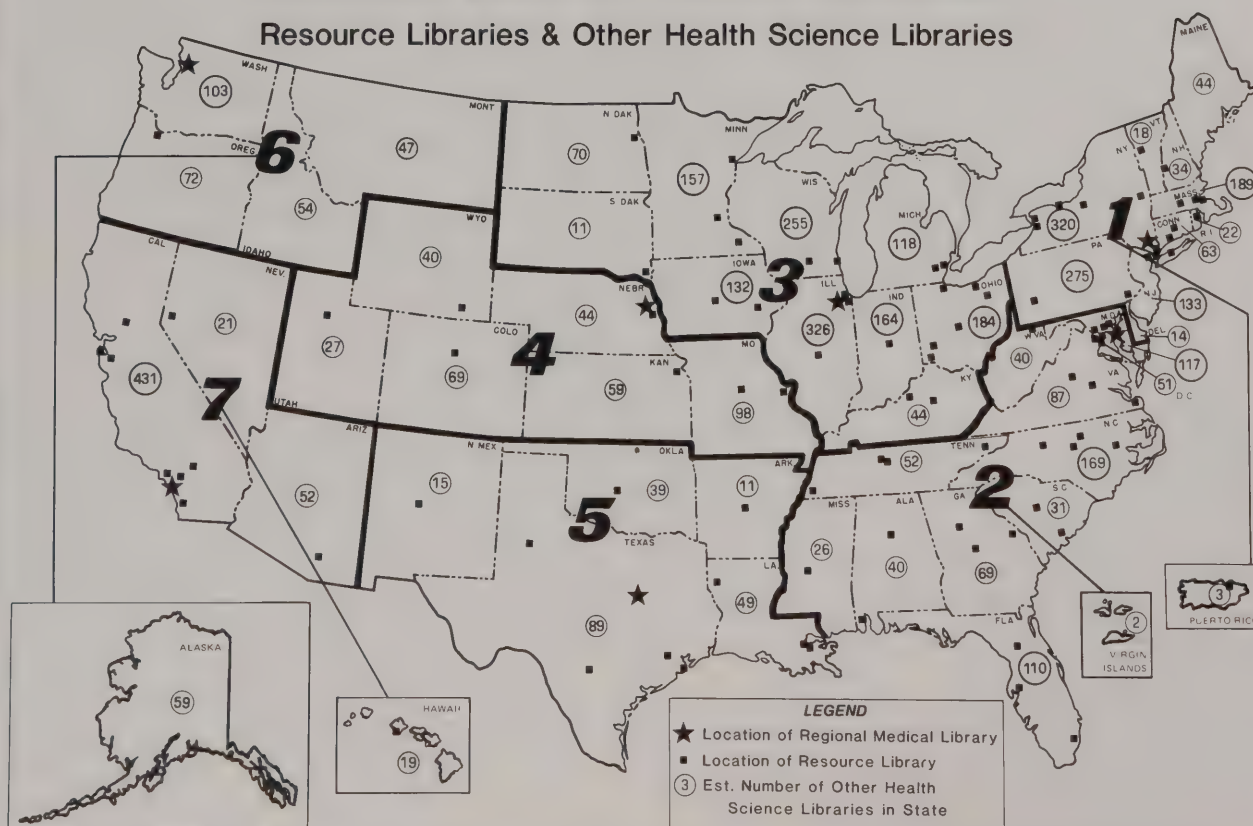
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## REGIONAL MEDICAL LIBRARY NETWORK: BUILDING A NATIONWIDE BASE

**A** formal national network of 7 Regional Medical Libraries, 125 resource libraries at medical schools, and 4,000 local medical libraries provides widespread access to published medical information. As the hub of the network, NLM is the key to a nationwide data gathering system that

connects far-flung centers of expertise, forming them into an efficient resource available to all.

### NATIONAL LIBRARY OF MEDICINE REGIONAL MEDICAL LIBRARY NETWORK Resource Libraries & Other Health Science Libraries





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The entrance to the National Library of Medicine.

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
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